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(54) **Facsimile information library**

(57) A facsimile information library facilitates easy storage and retrieval of information. The unit is self contained with status information viewable on the front panel LCD display 10. Pages can be added to the library by sending a page or pages to the facsimile library via the local facsimile machine 11, or from a remote facsimile machine, pages are numbered by selecting the required page number on the local facsimile dialling keypad. Several telephone line inputs 1, 2, 3 can be connected to the facsimile library. This will allow several enquiries onto the system at any one time. The local facsimile machine will still be able to transmit and receive facsimiles in the same way as being connected to an ordinary telephone line. The facsimile library proves a convenient method of instant information access to regularly requested documents.
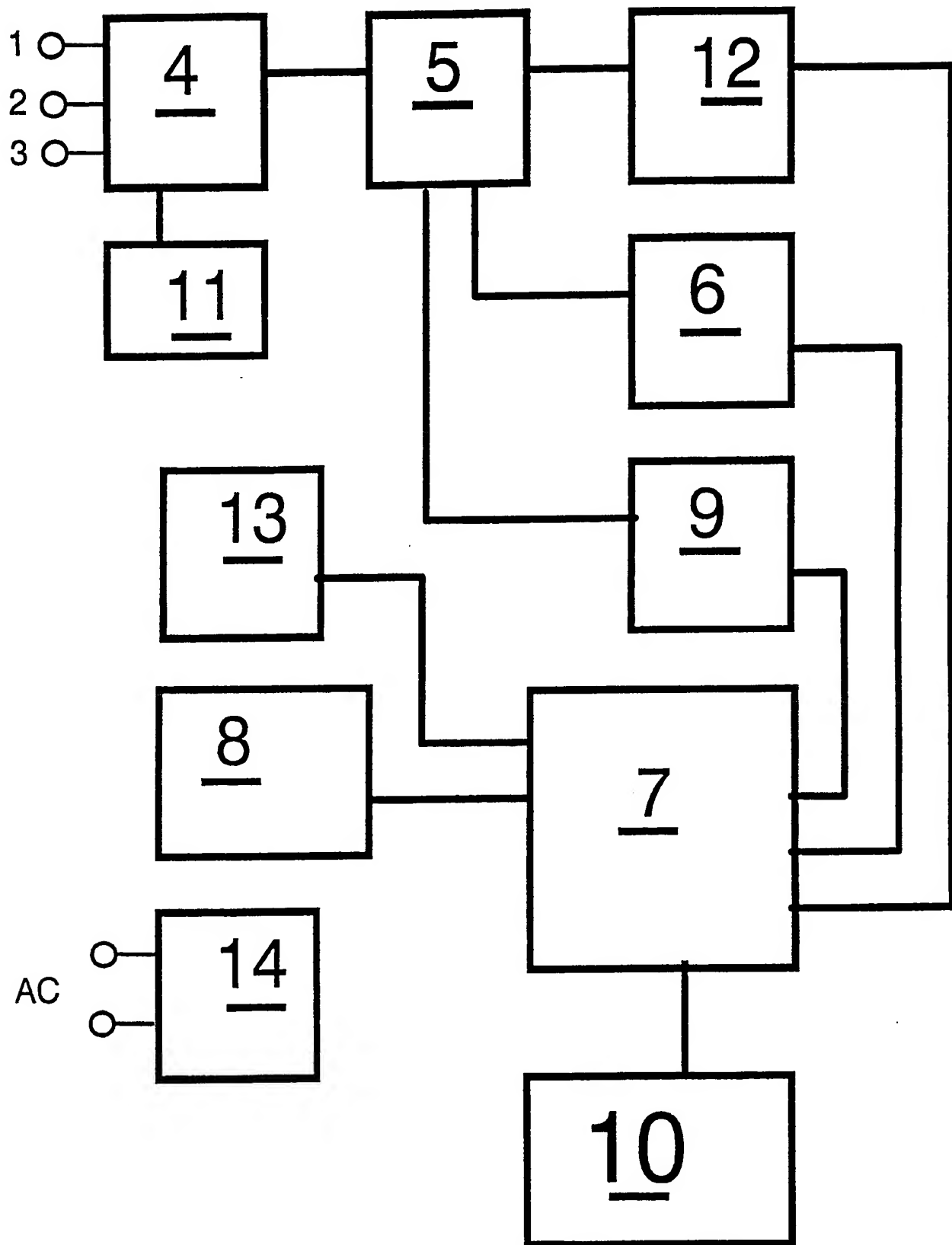
Figure 1
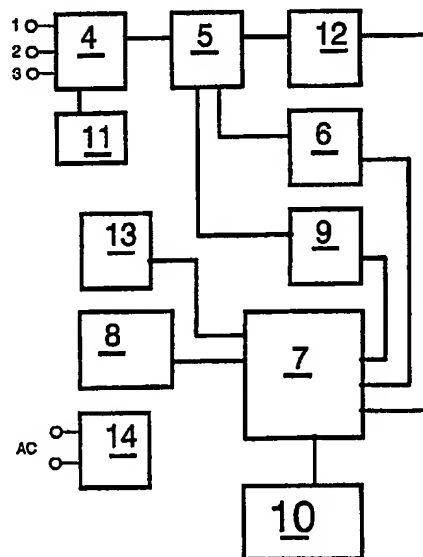
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Figure 1

Figure 2

Local Facsimile machine
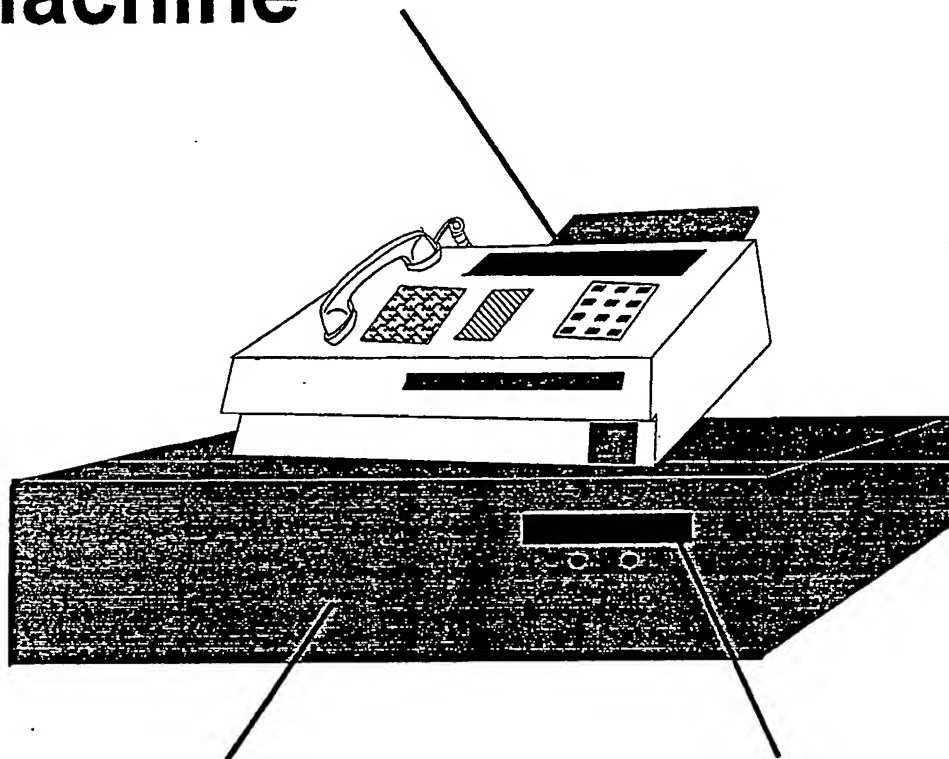
Base unit

User display

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FACSIMILE INFORMATION LIBRARY

This invention relates to a Facsimile Information Library .

This invention relates to apparatus and methods for storing and retrieving facsimile documents . More particularly , although not exclusively , the invention is related to a self contained apparatus , which is connected to a standard facsimile transceiver and several telephone lines . The apparatus can permanently store a plurality of documents , which can subsequently be selected , viewed or printed on any facsimile transceiver . Such apparatus will allow the user , via there facsimile receiver to select a facsimile document or facsimile documents , which are stored on the system , and produce facsimile copies of the selected documents from there facsimile transceiver . This will facilitate the easy and instant access to , any documentation that is stored on the apparatus . It is the object of the present invention to provide a convenient and effective arrangement for the selection and reception of a plurality of pre-stored facsimile documents .

According to the present invention there is provided apparatus for storing and retrieving facsimile documents , comprising of a base unit , which is of sturdy construction to facilitate a facsimile transceiver to be sited on top of the base unit . Internally housed within the base unit is electronic circuitry which incorporates a telephone line switching circuit , consisting of a plurality of relays to connect and route the incoming telephone line and the local facsimile transceiver . A telephone line conditioning circuit which absorbs high levels of voltage transients using gas discharge tubes and transorbs to protect all other components that are connected to this circuit . This circuit also converts the telephone line voltages to a common voltage range , which is compatible with other circuits of the system . Pre-recorded voice messages are stored in digitised format in EPROMs (Electrically programable Read Only Memories) or E^2PROMs which are used in guiding the caller through using the system . A digital to analogue converter contained within the voice message circuitry can convert the digitised voice messages back into comprehensible analogue speech signals , which can be played to users of the system for information and guidance purposes . A separate circuit allows the detection of touch tone frequencies and pulse dialling codes to be decoded from the telephone line , it is also proposed although not a specific embodiment of the design to be able to recognise phrases and sentences of callers for the purpose of selecting which facsimile page or pages are required to be transmitted .The tones or phrases will be digitised via an analogue to digital converter , this digitised information will be sent along a data bus to the main processing unit .

The main processing unit will consist of a microprocessor connected to all other parts of the system via a control bus and data bus . The microprocessor will follow a predefined sequence of instruction which are stored in EPROMs (Electrically programable Read Only Memories) or E^{2}PROMs , it is also proposed although not specific embodiment of the design to be able to update the programs instruction via the telephone line , when new revisions of the program software become available or errors in the program require correction . A small amount of RAM (Random Access Memory) will be utilised by the microprocessor for storing changing variables . It is also a proposed although not a specific embodiment of the design to be able to use a microcontroller to carry out the proposed tasks of the main processing unit . All facsimile documents will be stored in a non-volatile memory area ,it is proposed although not specific embodiment of the design to be able to store all of the facsimile documents on a hard disc or optical compact disc or in E^{2}PROM in a digitised format . A user display consisting of an LCD (Liquid Crystal Display) or LED (Light Emitting Diode) or Gas plasma is provided on the front of the base unit which displays status information and a switch matrix is provided on the unit for the user to select between normal operation or programming . The display and user switches are controlled and scanned by there own independent microcontroller , which transfers information via the data and control bus to the main processing unit .A sub-circuit connected to the data and control bus provides a facsimile / modem interface to the telephone line . The chip set that is used for the facsimile will support all the CCITT facsimile standards upto 14,400 bit /s and possible future faster transfer speeds .

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Documents may easily be added to the systems non-volatile data memory via the local facsimile transceiver . Also housed in the main unit is a switch mode power supply to provide power to each part of the system .

In order that the invention may be more readily understood , a number of embodiments thereof will now be described by way of example with reference to the accompanying drawings in which :

Figure 1 is a block circuit diagram of the base unit .

Figure 2 illustrates a typical casing for a variant of Figure 1

Referring to fig 1 of the drawings , it will be seen that the base unit includes a plurality of telephone lines 1,2,3 . Circuit 4 (the telephone line switching unit) detects the presents of a ringing voltage on any of the telephone lines 1,2,3 . After a pre set number of rings , the appropriate line 1,2 or 3 will be answered by circuit 4 . Circuit 12 (tone / pulse detection circuit) will then 'listen ' to the signal on the answered telephone line via circuit 5 (telephone line conditioning circuit) to detect the presents of a facsimile transmit tone (1100hz) . If a facsimile transmit tone is present , then circuit 4 will divert the incoming facsimile transmission to 11 (Local external facsimile machine) . In this way a facsimile will be receive in the conventional fashion .If circuit 12 does not detect the presents of a facsimile transmit tone , then circuit 12 will inform via digital signalling circuit 7 (Main processing Unit). Circuit 7 will then initialise via digital signalling , circuit 6 ,9,10,8 and 13 .

Circuit 7 will then commence running a predefined sequence of events which are stored in circuit 13 (Program memory) Circuit 7 will instruct circuit 6 (Pre-programmed voice messages) via digital signalling , to play one pre-recorded message . Circuit 6 then plays the message through circuit 5 and circuit 4 back to the calling party down the telephone line . The message played first may request the caller " to press start on there fax machine " . Circuit 12 will then await a facsimile receive tone . Circuit 12 detects the facsimile receive tone and informs via digital signalling circuit 7 . Circuit 7 will then retrieve the relevant page , possibly the index page or pages from circuit 8 (non-volatile data storage area). Circuit 7 will then transmit this page via circuit 9 (facsimile transceiver chip set), 5 and 4 to the calling party .While this process is in operation circuit 10 (the user display and switches) will show relevant status information . Once the facsimile transmission is complete circuit 7 will then instruct circuit 6 to play the second recorded message , Which would request the caller to "Please select the required page" . Circuit 12 would then detect via circuit 4 and 5 the pulses or touch tones generated by the callers facsimile keypad (number dialling buttons) .Circuit 7 would then translate the keys pressed to a number sequence , which would indicate the page number the caller requires . Circuit 7 check to ensure the page number request is valid by enquiring within circuit 8 . If the page number is valid and stored within circuit 8 , then circuit 7 will signal circuit 6 to play a pre recorded message " please press start on your fax now " . Circuit 12 will then inform circuit 7 of the facsimile receiving tone . Circuit 7 will then retrieve the required page from circuit 8 . Circuit 9 will then transmit the page to the caller via circuit 5 and 4 .

If the requested page is not a valid page number which is stored in circuit 8 . Then circuit 7 will request circuit 6 to play a recorded message ;-"Invalid entry , please request another page " . the caller can then select a new page number for transmission .This process can be repeated as many times as required by the caller . Once the caller has completed enquiries on the system , they simply 'hang up ' . Circuit 4 , 5 and 6 will detect that the call has finished and signal circuit 7 . Circuit 7 will then reset circuits 4,5,6,12,9,8,10 and 13 . This process will repeat if a telephone line 1,2 or 3 rings . It is also an embodiment of the present invention to be able to process concurrently one through to several telephone lines / facsimile enquiries at once . Thus multiple callers can use the system at once .This is the standard mode of operation , which is selected via circuit 10 ,(the user switch is set to run) . It is possible to enter a new page of facsimile information or pages of facsimile information if circuit 10 ,(the user switch is set to program) . The user then enters the page number via the externally connected local facsimile transceiver , circuit 11, keypad . The page or pages are then stored in circuit 8 . Circuit 10 notifies the user that the page or pages have been received and stored correctly in circuit 8 . .

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CLAIMS

FACSIMILE INFORMATION LIBRARY .

1   Apparatus for permanently storing a plurality of facsimile documents
, for subsequent selection and retrieval on any facsimile transceiver anywhere
in the World . Facsimile documents can be loaded into the apparatus for
storage via any standard facsimile machine , connected directly to the
apparatus , or connected remotely via an area network or telephone system
.

2   The apparatus as claimed in Claim 1 can be used as a standalone item
or directly connect to a standard facsimile transceiver and one through to
several telephone lines for external communications.

3   The apparatus as claimed in Claim 1 is a self contained storage and
retrieval system .

4   The apparatus as claimed in Claim 1 or Claim 2 or Claim 3 will be
transparent to a directly connected facsimile machine . The directly connected
facsimile machine can be used to receive and transmit facsimiles in the same
manner even though it is conected through this apparatus .

5   The apparatus as claimed in any preceding claims can programmed and
documents stored and added , via the directly connected facsimile machine
or via a computer system with a fax modem attachment ..

CLAIMS

FACSIMILE INFORMATION LIBRARY .

6   The apparatus as claimed in any preceding claims can be used by external users by dialling the apparatus via a telephone line .

7   The apparatus as claimed in any preceding claims can be used to select documents for facsimile transmission by the user or external users connected via the telephone lines. Selection of documents can be made by using voice recognition and or the number keys of the users telephone or facsimile transceiver. Selecting the required page number or multiple selection of page numbers . DTMF tone recognition or pulse recognition of the digits dialled to select the required page or pages .

8   The apparatus as claimed in any preceding claims can transmit via facsimile transmission the user selected documents , directly back to the user's facsimile machine either during the same telephone call or via a subsequent telephone call made by the apparatus .

9   The apparatus as claimed in any preceding claims can store one through to several thousand facsimile documents , for subsequent retrieval and or retransmission over telephone lines .

10   The apparatus as claimed in any preceding claims can be used by one through to several users concurently .

Relevant Technical Fields	Search Examiner M K REES
(i) UK Cl (Ed.M) H4F (FDB, FDC) H4K (K0D2)	
(ii) Int Cl (Ed.5) H04N (1/21)	Date of completion of Search 28 NOVEMBER 1994
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications.	Documents considered relevant following a search in respect of Claims :- 1 TO 10
(ii) ONLINE DATABASES: EDOC, WPI, INSPEC	

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages		Relevant to claim(s)
X	GB 2254535 A	(RG THOMSON) see abstract	1, 5, 6, 8, 9
X	GB 2211698 A	(AT & T) see Figure 1; page 2, line 20 to page 5, line 12	1, 6 to 9
X	GB 2024561 A	(TEKNOS SYSTEMS LTD) see whole document	1, 6, 8, 9
X	EP 0504068 A2	(CANON KK) see Figures 1 and 2; column 2, line 19 to column 3, line 46	1, 2, 6, 8 to 10
X	US 489333	(P BARAN ET AL) see Figure 1; column 5, line 28 to column 6, line 69	1, 6, 8, 9
X, E	WO 94/05113 A1	(TA RAMSAY ET AL) see Figure 1; page 15, line 1 to page 20, line 7	1, 5, 6, 8, 9
X	WO 91/15818 A1	(R KOLLIN ET AL) see whole document	1, 6 to 10
X	WO 90/10989 A1	(SPECTRAFAX CORP)	1, 6 to 10